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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,333	07/30/2003	Hardayal Singh Gill	HSJ9-2003-0106US1	9919

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EXAMINER

WATKO, JULIE ANNE

ART UNIT PAPER NUMBER

2653

DATE MAILED: 03/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/631,333

**Applicant(s)**

GILL, HARDAYAL SINGH

**Examiner**

Julie Anne Watko

**Art Unit**

2653

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 7, 10-12, 18, 21 and 22 is/are rejected.
- 7) ☒ Claim(s) 2-6, 8, 9, 13-17, 19 and 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Drawings*

1. The drawings filed on November 3, 2003, were received. These drawings are approved.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 7 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites the limitation “the bias spacer reduction layer” in line 1. There is insufficient antecedent basis for this limitation in the claims.

Regarding claim 18: See rejection above for claim 7.

### *Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 10-12 and 21-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Takano (US PAP No. 2004/0252419 A1).

As recited in claim 1, Takano shows a magnetic head (see Fig. 2b) comprising: a free magnetic layer 13 having two ends, two hard bias layers (11a and 11b), each adjoining a corresponding end of the free magnetic layer 13, and which create a bias magnetic field within the free magnetic layer (see arrow in Fig. 2b); a bias reduction layer 121 disposed parallel to the free magnetic layer; and a bias spacer layer 25 disposed parallel to and between the free magnetic layer and the bias reduction layer; wherein the bias reduction layer creates a magnetic field within the free magnetic layer (“cancellation of the field induced in the free layer by the main bias layers is achieved. This field cancellation is due to the presence of a return flux associated with the compensatory bias layer”, see ¶ 0016) that is directed oppositely to the bias magnetic field (see other arrow in Fig. 2b).

As recited in claim 10, Takano shows that a bias reduction material and a bias reduction layer thickness are selected (“magnetic properties of thin films are known to be very sensitive to a number of factors in addition to their **composition**. Said factors include, but may not be limited to, **thickness**”, see ¶ 0043, emphasis added) so as to produce a bias reduction magnetic field within the free magnetic layer, wherein the bias reduction magnetic field counteracts the bias magnetic field at positions within the free magnetic layer that are between ends of the free magnetic layer (see Fig. 2b). Furthermore, the product by process limitations in these claims (e.g. “selected”) are directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessman*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); *In re Marosi et al*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964, all of which make it clear that it is the patentability of the final

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structure of the product “gleaned” from the process limitations or steps, which must be determined in a “product by process” claim, and not the patentability of the process limitations. Moreover, an old or obvious product produced by a new method is not a patentable product, whether claimed in “product by process” claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear.

As recited in claim 11, Takano shows that the hard bias layers (11a and 11b) induce an edge bias magnetic field within the free magnetic layer at the ends of the free magnetic layer (see arrows in Fig. 2b), where the edge bias magnetic field is of sufficient strength to stabilize the free magnetic layer even when partially counteracted by a bias reduction magnetic field created by coupling of the free magnetic layer with the bias reduction layer 121 (“output is both stable as well as unaffected by the steps taken to achieve stability”, see ¶ 0013).

As recited in claim 12, in addition to the above teachings, Takano shows a hard disk drive (“magnetic disk storage”, see ¶ 0001) inherently comprising a disk having a surface that includes the magnetic medium; a motor coupled to rotate the disk; a slider having an air bearing surface; an actuator configured to hold the air bearing surface of the slider proximate to the surface of the disk; and a magnetic head disposed within the slider and forming part of the air bearing surface.

Regarding claim 21: See above for claim 10.

Regarding claim 22: See above for claim 11.

***Allowable Subject Matter***

6. Claims 2-6, 8-9, 13-17 and 19-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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7. Claims 7 and 18 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: The Examiner notes the teaching in Takano that “the parameters that characterize the layers named in the claims to be recited below should be regarded as critical rather than merely optimal” (see ¶ 0043). Because the layers in Takano are critical, the prior art of record neither shows nor suggests altering the Takano structure to arrive at the claimed structure.

### *Conclusion*

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Shimizu et al (US PAP No. 2003/0090844 A1) show a magnetoresistive device comprising free layers 122 and 126, “with such a layer thickness of a non-magnetic metal layer that directions of magnetization in the ferromagnetic layers are parallel to each other, whereby the free layer of a laminated structure preferably behaves as one body in the magnetic field from the carrier” (see ¶ 0048), and further disclose a known synthetic ferri structure with oppositely-magnetized free layers antiferromagnetically coupled by “thickness of the Ru layer of 5-9 Å” wherein “no examples have been proposed to use the synthetic ferri structure that arranges directions of magnetization between the Co layers to be parallel to each other” (see ¶ 0047).

Alps (JP 2004-6493) shows a huge MR device for a hard drive (see especially Figs. 1 and 12).

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Alps (JP 2004-14705) shows a huge MR element for a hard disk drive (see especially Figs. 1 and 10-11).

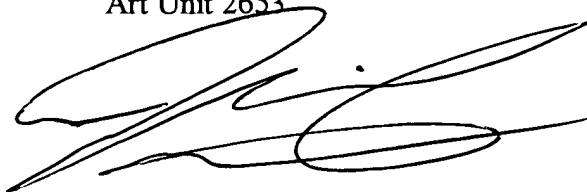
10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julie Anne Watko whose telephone number is (703) 305-7742. The examiner can normally be reached on Tues. & Thurs. until 9PM, Wed. & Fri. until 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William R. Korzuch can be reached on (703)305-6137. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Julie Anne Watko  
Primary Examiner  
Art Unit 2653

February 28, 2005  
JAW

A handwritten signature in black ink, appearing to read 'JAW', is written over the printed name and title of the examiner.